EXHIBIT 29

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File types supported by Windows Media Player

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The following table lists the multimedia file types that are supported by different versions of Windows Media Player (How to determine the version of Windows Media Player).

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File extension	Media Player 12	Media Player 11	Media Player 10	Media Player 9 Series	Player for Windows XP	Media Player 7
Windows Media formats (.asf, .wma, .wmv, .wm)	√	√	√	√	√	√
Windows Media Metafiles (.asx, .wax, .wvx, .wmx)	√	√	√	√	√	√
Windows Media Metafiles (.wpl)	√	√	√	√	-	-
Microsoft Digital Video Recording (.dvr-ms)	√	-	-	-	√	-
Windows Media Download Package (.wmd)	√	√	√	√	√	√
Audio Visual Interleave (.avi)	√	√	√	√	√	√
Moving Pictures Experts Group (.mpg, .mpeg, .m1v, .mp2, .mp3, .mpa, .mpe, .m3u)	√	√	√	√	√	√
Musical Instrument Digital Interface (.mid, .midi, .rmi)	√	√	√	√	√	√
Audio Interchange File Format (.aif, .aifc, .aiff)	√	√	√	√	√	√
Sun Microsystems and NeXT (.au, .snd)	√	√	√	√	√	√
Audio for Windows (.wav)	√	√	√	√	√	√
CD Audio Track (.cda)	√	√	√	√	√	√
Indeo Video Technology (.ivf)	√	√	√	-	√	√

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MP4 Audio file (.m4a)	√	-	-	-	-	-
MP4 Video file (.mp4, .m4v, .mp4v, .3g2, .3gp2, .3gp, .3gpp)	√	-	-	-	-	-

Windows Media formats (.asf, .wma, .wmv, .wm)

Advanced Systems Format (.asf)

The Advanced Systems Format (ASF) is the preferred Windows Media file format. With Windows Media Player, if the appropriate codecs are installed on your computer, you can play audio content, video content, or both, that is compressed with a wide variety of codecs and that is stored in an .asf file. Additionally, you can stream audio and video content with Windows Media Services, or you can package that content with Windows Media Rights Manager.

ASF is an extensible file format that stores synchronized multimedia data. It supports data delivery over a wide variety of networks and protocols. It is also suitable for local playback. ASF supports advanced multimedia capabilities including extensible media types, component download, scalable media types, author-specified stream prioritization, multiple language support, and extensive bibliographic capabilities that include document and content management.

Typically, ASF files that contain audio content that is compressed with the Windows Media Audio (WMA) codec use the .wma extension. Similarly, ASF files that contain audio content, video content, or both, that is compressed with Windows Media Audio (WMA) and Windows Media Video (WMV) codecs use the .wmv extension. Finally, content that is compressed with any other

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Windows Media Audio (.wma) files are Advanced Systems Format (.asf) files that include audio that is compressed with the Windows Media Audio (WMA) codec. By using a separate extension, users can install multiple players on their computer and associate certain players with the .wma extension for playback of audio-only sources.

Windows Media Video (.wmv, .wm)

Windows Media Video (.wmv) files are Advanced Systems Format (.asf) files that include audio, video, or both compressed with Windows Media Audio (WMA) and Windows Media Video (WMV) codecs. By using a separate extension, you can install multiple players on your computer and associate certain players with the .wmv extension for playback of audio and video sources.

Windows Media Metafiles (.asx, .wax, .wvx, .wmx, .wpl)

Advanced Stream Redirector (.asx)

Advanced Stream Redirector (.asx) files, also known as Windows Media Metafiles, are text files that provide information about a file stream and its presentation. ASX files go beyond the simple task of defining playlists to provide Windows Media Player with information about how to present particular media items of the playlist.

Windows Media Metafiles are based on XML syntax and can be encoded in either ANSI or UNICODE (UTF-8) format. They are made up of various elements with their associated tags and attributes. Each element in a Windows Media metafile defines a particular setting or action in Windows Media Player.

ASX files can point to any media file type that Windows Media Player recognizes and supports.

For more information about Windows Media Metafiles, visit the following Microsoft Web site:
    http://msdn2.microsoft.com/en-us/library/aa385262.aspx

Windows Media Audio Redirector (.wax)

Windows Media Audio Redirector (.wax) files are Windows Media Metafiles that reference Windows Media Audio (.wma) files.

Windows Media Video Redirector (.wvx)

Windows Media Video Redirector (.wvx) files are Windows Media Metafiles that reference Windows Media Video (.wmv) files

Windows Media Redirector (.wmx)

Versions of Windows Media Player that support this file type: Windows Media Redirector (.wmx) files are Windows Media Metafiles that reference Windows Media Audio (.wma), Windows Media Video (.wmv) files, or both.

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cannot. In Windows Media Player 9 Series, the auto playlist feature uses the .wpl format. The .wpl format is the default file format used for playlists that you save in Windows Media Player 9 Series.

Microsoft Digital Video Recording (.dvr-ms)

In Microsoft Windows XP Media Center Edition, Microsoft introduced the *.dvr-ms file format for storing recorded TV content. Similar to *.asf files, *.dvr-ms file enhancements permit key Personal Video Recorder (PVR) functionality, including time-shifting, live pause, and simultaneous record and playback. Video contained in a *.dvr-ms file is encoded as MPEG-2 video stream, and the audio contained in the *.dvr-ms file is encoded as MPEG-1 Layer II audio stream.

To play back unprotected *.dvr-ms files on Windows XP-based computers, you must have the following software and hardware components:

- Microsoft Windows XP Service Pack 1 (SP1) or later.
- The update that is documented in the following article in the Microsoft Knowledge Base must be installed on the computer: For more information, click the following article number to view the article in the Microsoft Knowledge Base:
    810243 DirectShow playback support for files recorded with Windows XP Media Center Edition

- A Windows XP-compatible DVD decoder.

For more information about *.dvr-ms files, visit the following Microsoft Web site:
    http://msdn2.microsoft.com/en-us/library/ms778831.aspx

File types supported by Windows Media Player http___web.archive.org...   moz-extension://63db42c3-2c72-5a4c-8bc0-e9699841c296/fsCaptured.html

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Windows Media Player automatically extracts the files that are contained in the package, adds the playlists in the package, adds the content to Media Library, displays the border skin in the **Now Playing** pane of Windows Media Player (in full mode), and then plays the first item in the playlist. For more information about .wmd files, visit the following Microsoft Web site:

http://msdn2.microsoft.com/en-us/library/aa386465.aspx

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Audio Video Interleave (.avi) is a special case of Resource Interchange File Format (RIFF). AVI is defined by Microsoft. The .avi file format is the most common format for audio and video data on a computer.

Audio content or video content that is compressed with a wide variety of codecs can be stored in an .avi file and played in Windows Media Player, if the appropriate codecs are installed on the computer. Video codecs that are frequently used in .avi files include the following codecs:

- DivX codec

  For more information, visit the following DivX Web site:
  http://www.divx.com

- Cinepak codec

  For more information, visit the following Cinepak Web site:
  http://www.probo.com/cinepak.php

- Indeo codec

  For more information, visit the following Ligos Web site:
  http://www.ligos.com

- DV codec
- MJPEG codec
- Uncompressed RGB or YUY2 codec

Audio codecs that are frequently used in .avi files include the following audio codecs:

- MP3 codec
- Microsoft Adaptive Differential Pulse Code Modulation (MS ADPCM)
- Uncompressed Pulse Code Modulation (PCM) codec

Moving Pictures Experts Group (.mpg, .mpeg, .m1v, .mp2, .mp3, .mpa, .mpe, .mpv2, .m3u)

The Moving Picture Experts Group develop the Moving Picture Experts Group (MPEG) standards. These standards are an evolving set of standards for video and audio compression.

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This standard permits the coding of progressive video at a transmission rate of about 1.5 million bits per second (bps). This file standard provides a video resolution of 352x240 at 30 frames per second (fps). When you use this standard, you receive a video that is slightly lower-quality than typical VCR videos.

Files that use the .m1v extension typically are MPEG-1 elementary streams that contain only video information. Files that use .mpg or .mpeg extensions typically are MPEG-1 system streams that contain MPEG-1-encoded video and MPEG-1 Layer II (MP2)-encoded audio.

However, MPEG-1 system streams do not exclusively use the .mpg and .mpeg extensions. MPEG-2 program streams also frequently use .mpg and .mpeg file extensions, but they contain MPEG-2-encoded video. Because Microsoft Windows operating systems provide only an MPEG-1 video decoder, Windows Media Player cannot play MPEG-2 program streams without an additional MPEG-2 video decoder (also known as a DVD decoder pack) installed. For more information about purchasing DVD decoder packs, visit the following Microsoft Web site:
http://www.microsoft.com/windows/windowsmedia/player/plugins.aspx

MPEG Audio Layer III (.mp3)

This standard has also evolved from early MPEG work. It is an audio compression technology that is part of the MPEG-1 and MPEG-2 specifications. The Fraunhofer Institute developed MP3 in Germany in 1991. MP3 uses perceptual audio coding to compress CD-quality sound with almost the same fidelity.

MPEG Audio Layer II (.mp2, .mpa)

MPEG Audio Layer II is an audio-coding standard that was originally developed as a part of the MPEG-1 specification and was later updated for the MPEG-2 specification.

M3U (.m3u)

An .m3u file is a metafile playlist that references .mp3 files and provides additional metadata for the items in the playlist.

Musical Instrument Digital Interface (.mid, .midi, .rmi)

Musical Instrument Digital Interface (MIDI) is a standard protocol for the interchange of musical information between musical instruments, synthesizers, and computers. This standard defines the codes for a musical event that include the start of a note, its pitch, length, volume, and musical attributes, such as vibrato. It also defines codes for various button, dial, and pedal adjustments that are used on synthesizers.

Audio Interchange File Format (.aif, .aifc, .aiff)

Apple Computer developed the Audio Interchange File Format (AIFF) audio file format. You can use this format to store

Windows uses the Wave Form Audio (WAV) file format to store sounds as waveforms. One minute of Pulse Code Modulation (PCM)-encoded sound can occupy as little as 644 kilobytes (KB) or as much as 27 megabytes (MB) of storage. This size of the storage space depends on the sampling frequency, the type of sound (mono or stereo), and the number of bits that are used for the sample.

Similar to the AVI and ASF format, WAV is only a file container. Audio content that is compressed with a wide variety of codecs and that is stored in a .wav file can be played back in Windows Media Player if the appropriate codecs are installed on the computer. The most common audio codecs that are used in .wav files include Microsoft Adaptive Differential Pulse Code Modulation (MS ADPCM) and uncompressed Pulse Code Modulation (PCM).

CD Audio Track (.cda)

CD Audio (.cda) tracks are audio files that are stored on CD media. You can play .cda files only from a CD-ROM. As a result, a sample file cannot be included in this article for you to play. To test a .cda file, either try to play a different .cda file from your CD-ROM or try to play a .cda file from a different CD-ROM. The .cda files are representations of CD audio tracks and do not contain the actual pulse code modulation (PCM) information. You cannot play the file if you copy a .cda file from the CD-ROM to your hard disk.

Indeo Video Technology (.ivf)

Indeo Video Files (IVF) are video files that are encoded by using the Indeo codec from Ligos Corporation. Indeo standards may change frequently. To make sure that you can play files that are encoded with this codec, make sure that you have the most current Indeo package. To verify that you have the latest Indeo package, contact Ligos Corporation. To do so, visit the following Ligos Web site:

http://www.ligos.com

To play an .ivf file, download the file to your hard disk before you play it. To do so, follow these steps:

1. Right-click the link to the .ivf file, and then click **Save Target As**.
2. Specify a location on your hard disk where you want to save the file.

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Windows Media Player Skins (.wmz, .wms)

A Windows Media Player skin (.wms) definition file is an XML text document that defines the elements that are present in a skin, their relationships, and their functionality. A script creator creates the skin definition file (.wms) and any associated JScript files (.js) that incorporate the art elements and add functionality to the skin.

A .wmz file is a compressed Zip archive that contains a Windows Media Player skin definition file and associated Jscript files and its supporting graphic files.

QuickTime Movie file(.mov)

Apple Computer developed the QuickTime file format to create, edit, publish, and view multimedia files. QuickTime format can contain video, animation, graphics, 3D and virtual reality (VR) content. Only QuickTime files version 2.0 or earlier can be played in Windows Media Player. Later versions of QuickTime require the proprietary Apple QuickTime Player. For more information, visit the following Apple Web site:

http://www.apple.com/quicktime

MP4 Audio file (.m4a)

.m4a (audio only) is often compressed using AAC encoding (lossy), but can also be in Apple Lossless format.

MP4 Video file (.mp4, .m4v, .mp4v, .3g2, .3gp2, .3gp, .3gpp)

MPEG-4 is an International Standards Organization (ISO) specification that covers many aspects of multimedia presentation including compression, authoring and delivery. Although video compression and file container definition are two separate and independent entities of the MPEG-4 specification, many people incorrectly believe that the two are interchangeable. You can implement only portions of the MPEG-4 specification and remain compliant with the standard.

The MPEG-4 file format, as defined by the MPEG-4 specification, contains MPEG-4 encoded video and Advanced Audio Coding (AAC)-encoded audio content. It typically uses the .mp4 extension. Windows Media Player does not support the playback of the .mp4 file format. You can play back .mp4 media files in Windows Media Player when you install DirectShow-compatible MPEG-4 decoder packs. DirectShow-compatible MPEG-4 decoder packs include the Ligos LSX-MPEG Player and the EnvivioTV

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For more information about EnvivioTV , visit the following Envivio Web site:
http://www.envivio.com/products/

Microsoft has chosen to implement the video compression portion of the MPEG-4 standard. Microsoft has currently produced the following MPEG-4-based video codecs:

- Microsoft MPEG-4 v1
- Microsoft MPEG-4 v2
- Microsoft MPEG-4 v3
- ISO MPEG-4 v1

.3gp (3GPP file format) is a multimedia container format defined by the Third Generation Partnership Project (3GPP) for 3G UMTS multimedia services. It is used on 3G mobile phones but can also be played on some 2G and 4G phones.

.3g2 (3GPP2 file format) is a multimedia container format defined by the 3GPP2 for 3G CDMA2000 multimedia services. It is very similar to the 3GP file format, but has some extensions and limitations in comparison to 3GP.

The **.3gp2** file type is primarily associated with '3GPP2' . ◄C►

Windows audio file (.aac, .adt, .adts)

◄C►   **Advanced Audio Coding (.aac)** is a standardized, loss compression and encoding scheme for digital audio. Designed to be the successor of the MP3 format, AAC generally achieves better sound quality than MP3 at similar bit rates.

Audio Data Transport Stream (.adts) is used if the data is to be streamed within a MPEG-2 transport stream, consisting of a series of frames, each frame having a header followed by the AAC audio data. ◄C►

MPEG-2 TS Video file (.m2ts)

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.m2ts is a filename extension used for the file for Blu-ray Disc Audio-Video (BDAV) MPEG-2 Transport Stream (M2TS) container. This container format is commonly used for high definition video on Blu-ray Disc and AVCHD. ◄C►

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⊖ More information

Third-party information disclaimer

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⊖ Properties

Article ID: 316992 - Last Review: December 24, 2013 - Revision: 26.0
Applies to

- Windows Media Player 12
- Windows Media Player 11
- Windows Media Player 10
- Microsoft Windows Media Player 9 Series
- Microsoft Windows Media Player 7.0

Keywords: kbinfo kbcip KB316992

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